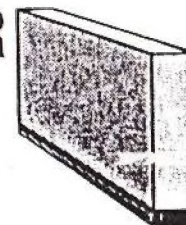


# SILVER

User manual



Congratulations on your decision to purchase this product.  
The SILVER videographic workstation has been developed as the result of five years of research into the needs of professionals in the field of videographic creation and image treatment. The SILVER philosophy combines the latest technology, a flexible approach and the highest standards of construction to offer you a power and flexibility unrivalled at any price.

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## Chapter 1 introduction

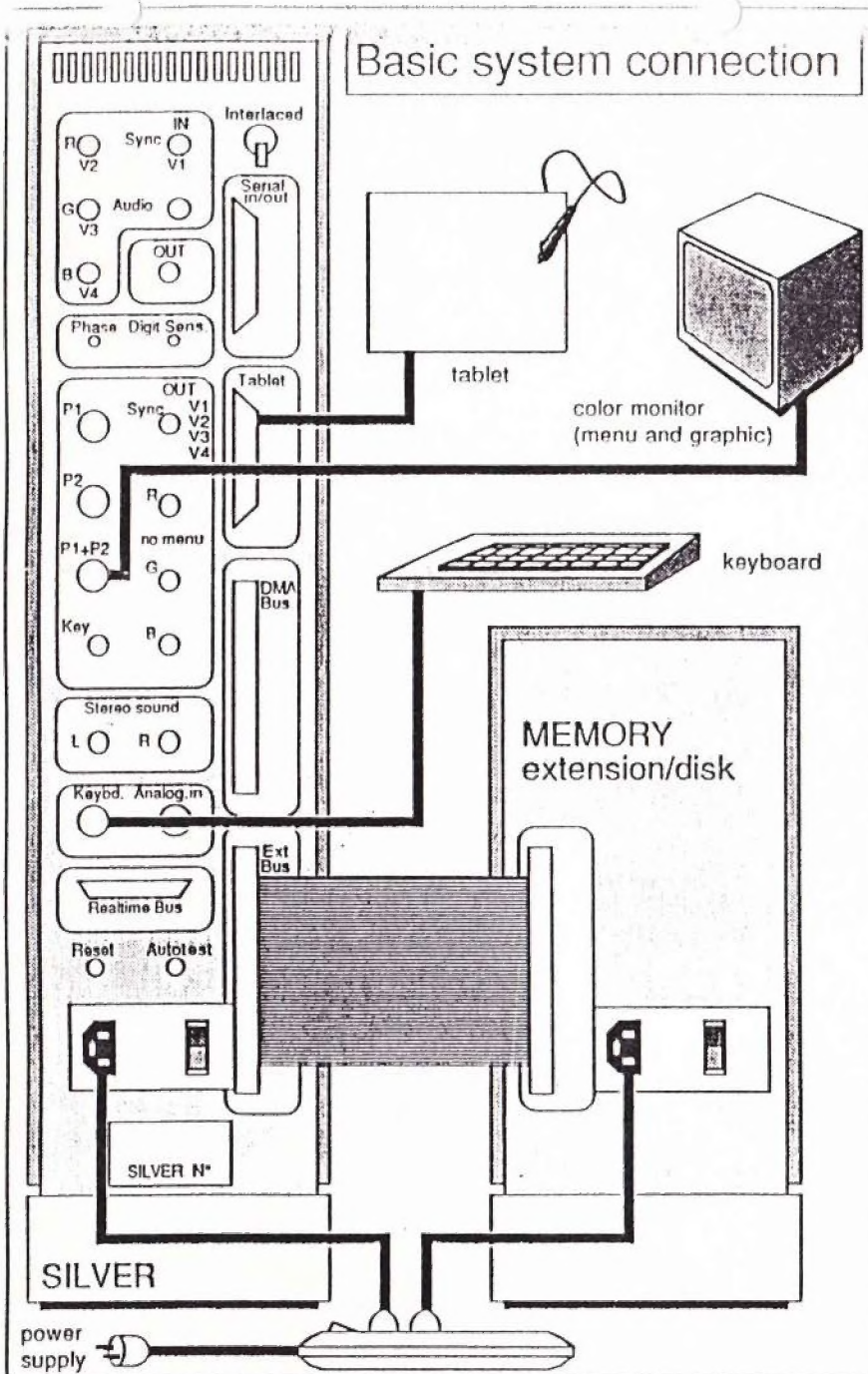
Basic system connection .....	page 1
Connection and cartridge installation .....	2
Testing the installation .....	3
Screen configurations .....	5
Connection to FADEC for digitizing .....	6
Connection to FADEC and ENCODER .....	7

## Chapter 2 technical section

Diagram of SILVER rear panel .....	page 1
Rear panel description .....	2
Technical specifications .....	5

## Chapter 1 - introduction





## Connection and cartridge installation

This first chapter deals with the installation and testing of the SYSTEM cartridge (which is necessary for other applications to operate), and the GRAF 65000 cartridge. Even if you have bought more programs, these are the **ONLY** cartridges that you should install and test at this stage.

In order for your SILVER to function correctly, you must set aside sufficient time for the procedures described in this chapter.

Carefully remove the units from their packaging and position them on a stable surface.

Connect the tablet, keyboard, power supply cable and **ONE** monitor screen (in socket P1+2) to the SILVER (see diagram on the previous page).

Even if you have the SILVER MEMORY EXTENSION/DISK unit, do **NOT** connect it to the system at this stage.

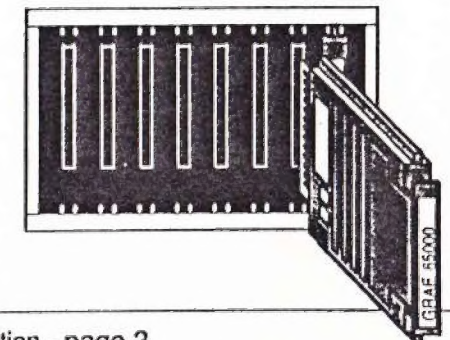
Ensure that the SILVER is switched OFF.

Remove the 'SYSTEM' and 'GRAF 65000' application cartridges from their packaging.

Remove the trap door covering the cartridge compartment by prising the cut-out corner using your thumbnail. (the trap door is located on the right face of the SILVER).

Holding the cartridge with the DE GRAFE insignia to the **LEFT**, carefully slide it into the connector at the back of the compartment.

Insert **SYSTEM** and **GRAF 65000 ONLY** (into slots 1 and 2 respectively) ... the slots are numbered 1 to 8 from left to right.





When you have installed the two cartridges (SYSTEM and GRAF 65000) in the slots, switch on the SILVER and the monitor. The LED indicator in the SILVER's granite base should be alight.

You should see two icons appear at the top of the screen...



If these do not appear, switch off the SILVER and check that both cartridges are correctly inserted in the slots... then WAIT 10 SECONDS and switch the SILVER on again. If there are still no icons on the screen, check that the monitor is correctly adjusted and that all the cables are correctly connected.

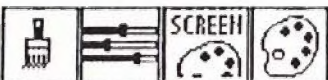
If all is well you can proceed...

Selections are made by positioning the on-screen cursor (using the pen) over an icon from the menu, and clicking the tip of the pen onto the tablet. Click the GRAF 65000 icon to select that application for use...



The icon is now displayed in inverse video... and the main function types appear in the next row down. The drawing type functions are selected by default and the functions of that type are displayed in the next two rows.

Click one of the function icons (rows 3 and 4)... the sub-options available for that function appear at the base of the screen...



To test that the system is functioning correctly, follow the procedure described below...



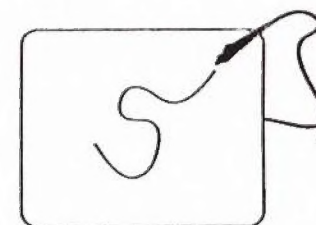
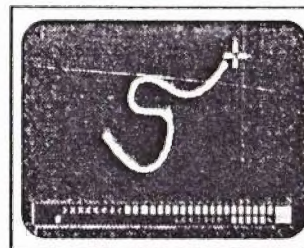
Click the pen on the DRAWING FUNCTIONS icon.



Click the pen on the FREEHAND function.

Click the pen in the BLACK part of the menu (anywhere on screen except on an icon)... the menu disappears. The screen is blank except for a palette of colors at the bottom.

Try drawing on the screen... press the tip of the pen on the tablet and move the pen (without releasing the tip).



To go back to the menu, click the pen at the base of the tablet (where the cursor is no longer visible).



Click the pen on the LIST icon... this gives a list of all cartridges installed in the system together with information. The SYSTEM cartridge should be listed in position 1 and GRAF 65000 in position 2. Click a second time to return to the menu.

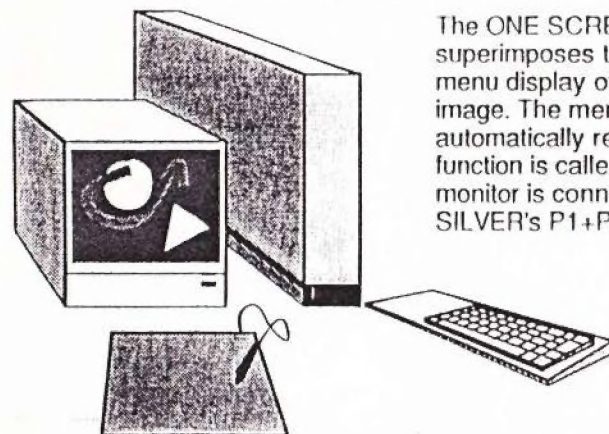
If all is well, you can install and test (ONE BY ONE) any remaining application cartridges as you have done for SYSTEM and GRAF 65000. You should then refer to the respective user manual for detailed information on each application.

### Very important

Each time the SILVER is switched off, WAIT AT LEAST 10 SECONDS before switching on again.

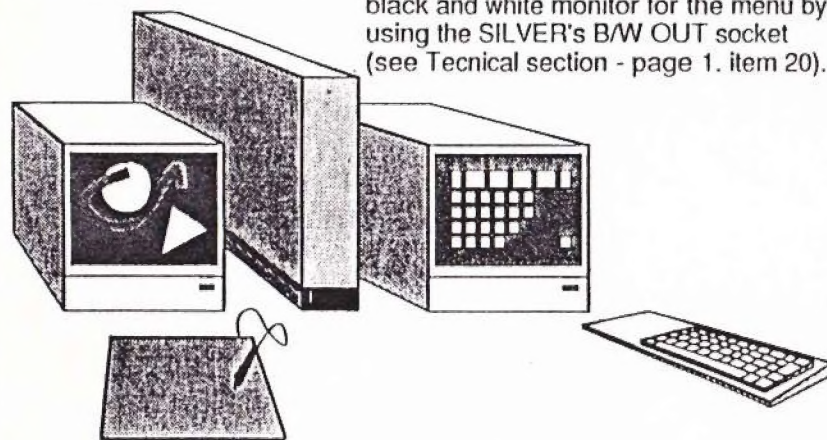


## Different screen configurations



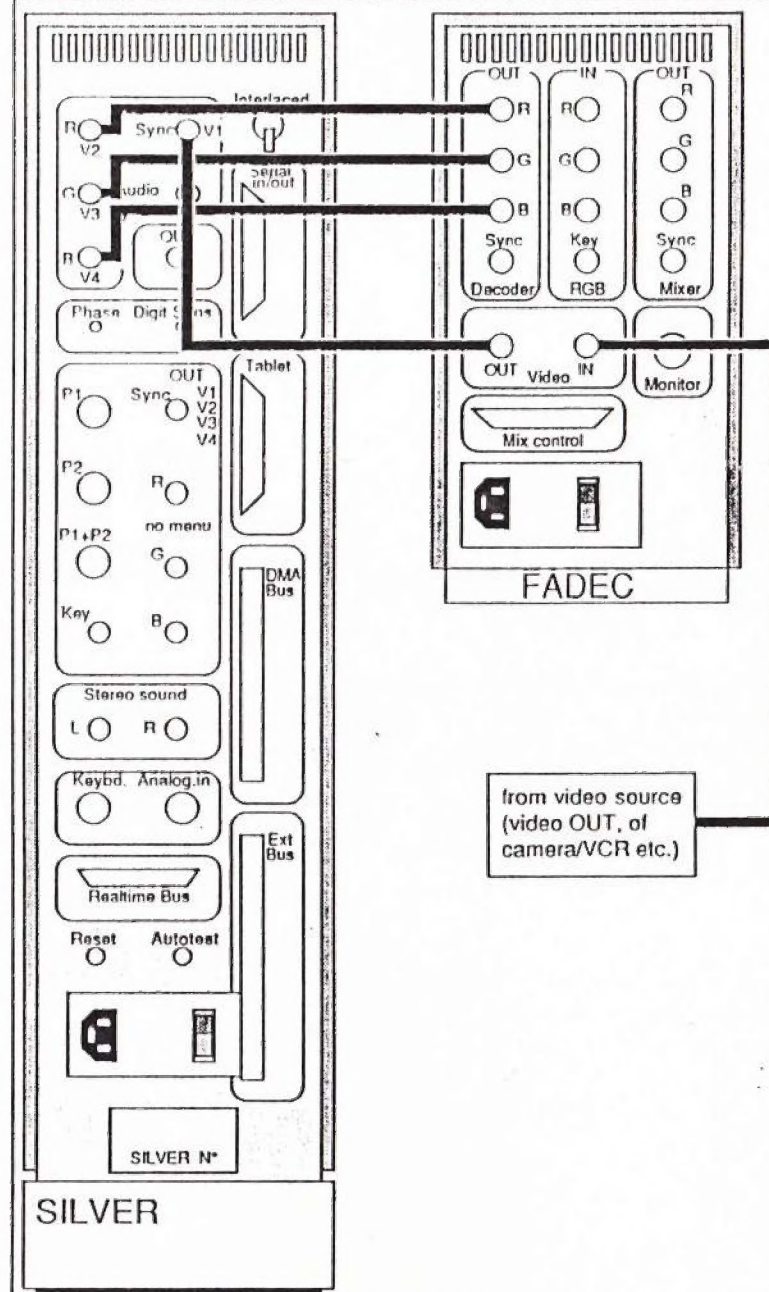
The ONE SCREEN configuration superimposes the SILVER's menu display over the graphic image. The menu is automatically removed when a function is called. The color monitor is connected to the SILVER's P1+P2 socket.

The TWO SCREEN configuration one monitor continuously displays the menu while the graphic image is displayed continuously on the second monitor. The MENU monitor is connected to the SILVER's P2 socket and the GRAPHICS monitor is connected to the P1 socket. You may use a black and white monitor for the menu by using the SILVER's B/W OUT socket (see Technical section - page 1, item 20).



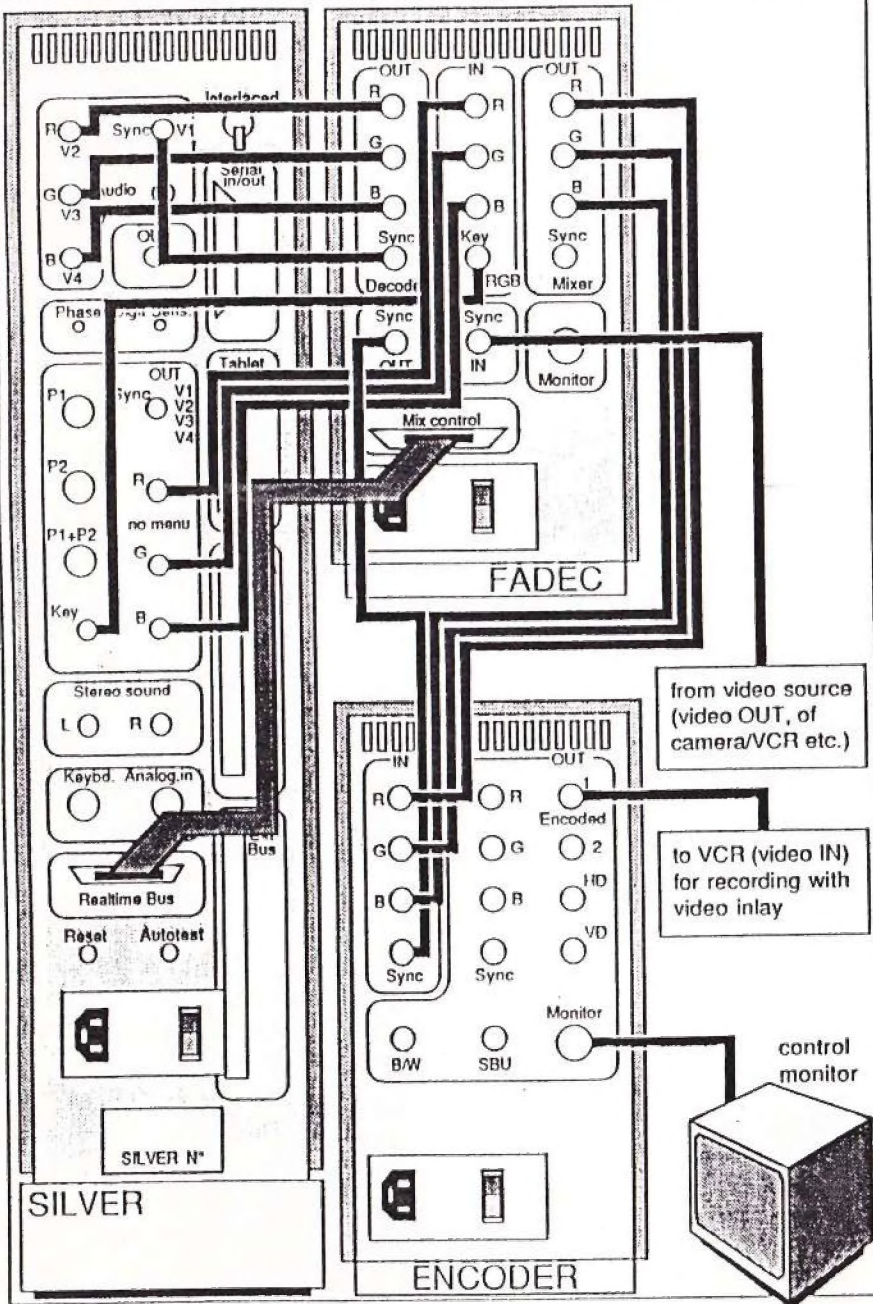
**WARNING :** The following monitors are NOT suitable for use with the SILVER: **SONY Profeel KX20** and **GRUNDIG PM 215 RGB**  
No responsibility will be accepted for possible damage caused in use of these monitors.

## Digitizing images from video camera / VCR





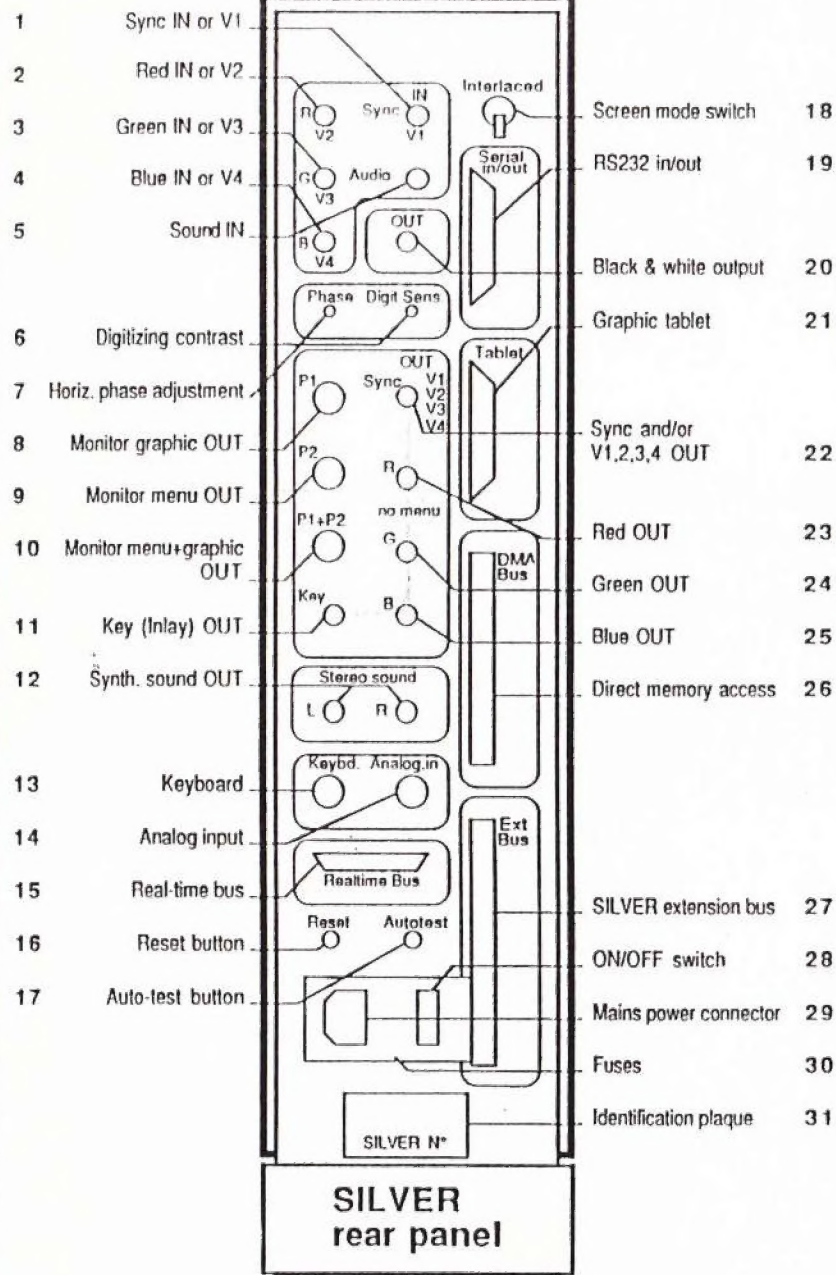
## Recording to a VCR with video inlay



## Chapter 2 - technical section



## SILVER rear panel description



1	Sync IN/Video 1	External sync input (Genlock on all video signals 1 Volt pp, 75 Ω). Picture sync input for digitizing (video) ...or video 1 input.
2,3,4	R.G.B IN/ Video 2,3,4	Input for component colours Red, Green and Blue of the video image for digitizing ...or Video 2, Video 3, Video 4 inputs.
5	Audio IN	Audio input for numerical processing in real-time. The sound is output only on sockets 8(P1), 9(P2) and 10(P1+P2) - (programmable outputs).
6	Digit sensitivity	Digitizing contrast adjustment potentiometer.
7	Phase	Phase adjustment potentiometer, allows lateral positioning of video 1 image in relation graphic image.
8	P1 Monitor (graphic only out)	Color monitor output of graphic (or digitized) images. Output for sound input at 5 (Audio IN) and/or of sound generated by the SILVER.
9	P2 Monitor (menu only out)	Color monitor menu only output. Output of sound input at 5 (Audio IN) and/or of sound generated by the SILVER.
10	P1+P2 Monitor (graphics + menu out)	Color monitor output of graphic (or digitized) images with inlay of the menu in color. Output of sound input at 5 (Audio IN) and/or of sound generated by the SILVER.
11	Key OUT ('Inlay' key out)	Black and white video output, carrying sync, linked with video inlay. For Video 1, Video 2, Video 3, Video 4 inlay control using the FADEC decoder. Inlay signal for extension inlayer or console. Inlay logic is as follows : Black... SILVER image White... Video(s) 1,2,3 or 4 inlay.
12	Stereo Sound L & R	Left/right outputs for the integrated stereo sound synthesizer.











13	<b>Keyboard</b>	Keyboard input connection.
14	<b>Analog IN</b>	Analog signal input allowing numerical processing according to light, temperature, sound, rhythm etc...
15	<b>Real Time Bus</b>	High speed bus for realtime transmission to large computers or specialised extensions, notably the FADEC, for image processing (fading/sequencing and realtime video antialiasing).
16	<b>Reset</b>	Button for initialisation of the SILVER. For use in the event of loss of user control of the SILVER. Does not destroy the screen image.
17	<b>Autotest</b>	If the auto-test cartridge is present in one of the application slots, then this button activates an auto verification of the circuits. <b>THE SCREEN IMAGE WILL BE DESTROYED !!!</b> If the auto-test cartridge is not present, 3 tones will sound (an octave apart, from high to low), (the screen image will not be destroyed).
18	<b>Interlaced (screen display mode switching)</b>	Stabilises the image by means of non interlacing the output video signal (Non-interlaced) so that a domestic television receiver may be used in place of a monitor. Important note: the position "Non-interlaced" is operational only when there is NO video signal present at the Sync IN / Video 1 IN socket.
19	<b>Serial IN/OUT</b>	RS232 serial input/output for connection to any equipment using that standard (eg: printers), and notably for connection to the SILVER VTC (for recording frame by frame to a video recorder).
20	<b>B/W Menu</b>	Separate black and white menu output (8 grey levels) for connection to a black and white monitor.
21	<b>Tablet</b>	Graphic tablet input connection.
22	<b>Sync OUT</b>	If a signal (sync or video) enters on Sync IN/Video 1 then the same signal is output simultaneously with either Video 1 or Video 2 or Video 3 or Video 4. If nothing is input on Sync IN/Video 1, the SILVER will generate its own sync signal here.

23, 24,25	<b>R.G.B OUT/ Video 2,3,4</b>	Output of the image's component colors - Red, Green and Blue for output to an RGB monitor, photographic screen copier or RGB console. Important note: the menu is NEVER present on these outputs.
26	<b>D.M.A. bus (direct memory access bus)</b>	Bus allowing direct access to the SILVER's video memory for future extensions.
27	<b>EXT Bus (SILVER extension bus)</b>	Extension bus, notably for connection to an IBM PC*, AT* or compatible computer, for external piloting of the SILVER and connection of SILVER MEMORY EXTENSION/DISK DRIVE.
28	<b>ON/OFF switch</b>	In position '1'... ON In position '0'... OFF
29	<b>Mains connector</b>	Electrical connection 210-240 Volt, 50 Hz (europe) 110 Volt 60 Hz (US). A suitable GROUND connection should be ensured.
30	<b>Fuses</b>	Housing for the 2 safety fuses. 1A anti-surge (europe) 2A anti-surge (US).
31	<b>Identification plaque</b>	This plaque gives the model name (SILVER) and complete serial number for your computer. It should NOT, UNDER ANY CIRCUMSTANCES be removed, scratched or torn. This would immediately render your guarantee invalid.








## SILVER technical specifications


### VIDEO INPUT SIGNAL


<b>R</b> 	TYPE	: RGB analogic
<b>G</b> 	NOMINAL LEVEL	: 0.7 Vpp (Non-composite)
<b>B</b> 	POLARITY	: Positive bright
	IMPEDANCE	: 75 Ω
	CONNECTOR	: 3 BNC connectors
<b>Sync</b> 	TYPE	: SYNC. composite (H & V mixed)
	NOMINAL LEVEL	: 0.3 V pp
	POLARITY	: Negative
	IMPEDANCE	: 75 Ω
	CONNECTOR	: BNC connector
<b>V2</b>  <b>V1</b> 	TYPE	: Composite video (PAL, SECAM, CCIR in EU, NTSC in US)
<b>V3</b> 	NOMINAL LEVEL	: 1 V pp
<b>V4</b> 	POLARITY	: Positive bright. Negative Sync
	IMPEDANCE	: 75 Ω
	CONNECTOR	: 4 BNC connectors



### VIDEO OUTPUT SIGNAL


<b>B/W MENU</b> 	TYPE	: CCIR composite video (analogic)
	NOMINAL LEVEL	: 1 Vpp (0.7 Vpp bright, 0.3 Vpp Sync)
	POLARITY	: Positive bright. Negative Sync
	IMPEDANCE	: 75 Ω
	CONNECTOR	: BNC connector
<b>KEY</b> 	TYPE	: CCIR composite video
	NOMINAL LEVEL	: 1 Vpp (0.7 Vpp bright, 0.3 Vpp Sync)
	POLARITY	: Positive bright. Negative Sync
	IMPEDANCE	: 75 Ω
	LOGIC	: 0 V (black) = SILVER 0.7 V (white) = VIDEO
	CONNECTOR	: BNC connector

<b>R</b> 	TYPE	: RGB analogic
<b>G</b> 	NOMINAL LEVEL	: 0.7 Vpp (Non-composite)
<b>B</b> 	POLARITY	: Positive bright
	IMPEDANCE	: 75 Ω
	CONNECTOR	: 3 BNC connectors

<b>Sync</b> 	TYPE	: SYNC. composite (H & V mixed)
	NOMINAL LEVEL	: 0.3 V pp
	POLARITY	: Negative
	IMPEDANCE	: 75 Ω
	MODE	: INTERN
	CONNECTOR	: BNC connector

<b>V1</b> 	TYPE	: Composite video (PAL, SECAM, CCIR in EU, NTSC in US)
<b>V2</b>	NOMINAL LEVEL	: 1 V pp
<b>V3</b>	POLARITY	: Positive bright. Negative Sync
<b>V4</b>	IMPEDANCE	: 75 Ω
	MODE	: GENLOCK
	SWITCH	: by Software
	CONNECTOR	: BNC connector



<b>P1</b> 	TYPE	: Monitor
<b>FAST</b>	RGB LEVEL	: 0.7 Vpp 75 Ω
<b>SLOW</b>	SYNC OR	
<b>SOUND</b>	VIDEO LEVEL	: 0.3 Vpp. or 1 Vpp 75 Ω
	SLOW switching	: 11 V ± 10%
	FAST switching	: 0 V / 1 V 75 Ω
<b>P2</b> 	SOUND OUTPUT	: 100 mV 4.7 K Ω
	CONNECTOR	: 2 x 8 pin DIN connectors

<b>P1+P2</b> 	TYPE	: Monitor
	RGB LEVEL	: 1 Vpp. (0.7 Vpp USA) 75 Ω
	SYNC OR	
	VIDEO LEVEL	: 0.3 Vpp. or 1 Vpp 75 Ω
	SLOW switching	: 11 V ± 10%
	FAST switching	: 0 V / 1 V 75 Ω
	SOUND OUTPUT	: 100 mV 4.7 K Ω
	CONNECTOR	: 8 pin DIN connector



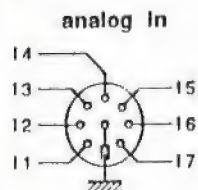
## AUDIO SIGNAL

Audio 

Stereo Sound  
L  R 

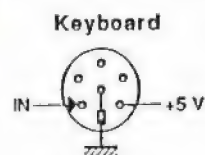
TYPE : SOUND  
NOMINAL LEVEL : 100 mV  
IMPEDANCE : 4.7 K  $\Omega$  to 10 K  $\Omega$   
CONNECTOR : 3 cinch connectors

## ANALOGIC INPUT



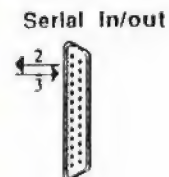
TYPE : 7 analogic inputs  
SIGNAL LEVEL : 0 V to 5 V  
IMPEDANCE : 1.5 K  $\Omega$  ( $V_{in} = 2.5$  V)  
Conversion TIME : 100  $\mu$ s  
TOTAL unadjusted error :  $\pm 1/2$  LSB  
RESOLUTION : 8 bits  
CONNECTOR : 8 pin DIN connector

## KEYBOARD INPUT



TYPE : RS 232  
CONFIGURATION : 8 bits - 2 bits stop - no parity  
SPEED : 2400 baud  
SIGNAL LEVEL : 0 V - 5 V (TTL)  
CONNECTOR : 6 pin DIN connector

## SERIAL IN/OUT



TYPE : RS 232 C  
CONFIGURATION : 5, 6, 7, 8 bits - 1 or 2 bits stop  
even, odd, no parity  
SPEED : 300 to 9600 baud  
SIGNAL LEVEL : -12 V, +12 V  
HANDSHAKING : YES  
CONNECTOR : SUB.D 25 pins

## TABLET IN/OUT

Tablet



TYPE : RS 232 C  
CONFIGURATION : 8 bits - 1 bit stop - no parity  
SPEED : 9600 baud  
SIGNAL LEVEL : -12 V, +12 V  
CONNECTOR : SUB.D 25 pins

## DMA BUS



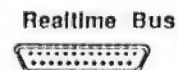
TYPE : High speed direct memory access  
SIGNAL LEVEL : TTL  
SPEED :  $2 \times 10^6$  bytes per second  
CONNECTOR : HE10 50 pins

## EXT BUS



TYPE : For extension  
SIGNAL LEVEL : TTL  
CONNECTOR : HE10 60 pins

## REALTIME BUS



TYPE : 12 bits at 14 MHz  
SIGNAL LEVEL : TTL  
SPEED :  $1 \times 10^7$  bytes per second  
CONNECTOR : SUB.D 25 pins

## HARDWARE CONTROL

- ☐ RESET : initialisation
- ☐ AUTOTEST : hardware test (using cartridge)
- ☐ PHASE : horizontal phase adjustment  $\pm 1 \mu s$  (min)
- ☐ DIGIT SENSITIVITY : +3 dB -2 dB
- ☐ INTERLACED : 313 lines / 312.5 lines  
(with non genlock function) in EU  
  
263 / 262.5 lines  
(with non genlock function) in US

## DISPLAY FORMATS AND DRAWING CAPABILITY

<input type="checkbox"/> Programmable display format		EU	US
	display window	368 x 286	308 x 242
		736 x 286	616 x 242
		736 x 572	616 x 484
	384 x 320		
	768 x 320		
	768 x 640 (interlaced)		

- ☐ 1 to 16 planes with 2 to 65000 colors plus 8 color menu plane.
- ☐ Color palette of  $16 \times 10^6$  colors
- ☐ Pixel arithmetic and logic calculation at 70 ns
- ☐ Fills areas and polygons at 70 ns per pixel
- ☐ 490,000 pixels in video RAM (max)
- ☐ Automatic clipping
- ☐ No limit for zoom factor and positioning
- ☐ Panning, scrolling, mirror x/y
- ☐ Sprites
- ☐ Color fading, airbrush, antialiasing
- ☐ Video fading control
- ☐ Multiple video inlay

## LOGIC SPECIFICATION

- ☐ 7 dedicated processors (8 to 64 bit, 2 MHz to 14 MHz)  
controlled by Z80B at 4.77 MHz
- ☐ ROM : 8 K bytes (BOOT)
- ☐ RAM : 360 K bytes to 424 K bytes
- ☐ Cartridges : 256 max (8 on SILVER)
- ☐ Cartridge capacity : 64 K ROM + 8 K RAM
- ☐ Sound processor  
SYNTHESIZER : 3 Tone generators (30 Hz to 50 KHz)  
1 noise generator  
Mixers  
Amplitude control (16 levels)  
Envelope generator  
H.P. intern
  - OUTPUT L : channels A, B, Noise
  - OUTPUT R : channels B, C, Noise
  - PERITEL OUTPUT : A, B, C, Noise & Audio IN
- ☐ VIDEO DIGIT : 16 bit resolution
  - B/W or color digitizing
  - total unadjusted error  $\pm 1/2$  LSB
  - conversion time : 70 ns (max)
  - bandwidth : 3 MHz, 0 -3 dB
  - signal/noise ratio : 36 dB
- ☐ SOUND DIGIT : 8 bit resolution
  - total unadjusted error  $\pm 1/2$  LSB
  - conversion time : 100 ns (max)
- ☐ PC communication : Access to all standard graphics primitives  
using optional interface.

## CRT MONITOR INTERFACE AND GENLOCK

- ☐ Separate red, green and blue analog outputs  
(0.7 Vpp positive into 75  $\Omega$  impedance)
- ☐ Mixed horizontal and vertical sync  
(0.3 Vpp negative into 75  $\Omega$  impedance)
- ☐ Horizontal frequency EU : 15625 Hz US : 15750 Hz
- ☐ Horizontal frequency EU : 50 Hz US : 60 Hz
- ☐ Signal bandwidth 35 MHz -3 dB  
3 MHz -3 dB in digit mode  
Signal/noise 36 dB
- ☐ Pixel frequency 14 MHz or 7 MHz
- ☐ Pixel settle time 10 ns
- ☐ Total lines/frame EU : 313 or 312.5 US : 263 or 262.5
- ☐ Horiz. blanking time EU : 12  $\mu$ s US : 11.5  $\mu$ s
- ☐ Vertical blanking time EU : 1.7 ms US : 1.33 ms
- ☐ Horizontal pulse time EU : 4.4  $\mu$ s US : 4.7  $\mu$ s
- ☐ Vertical pulse time EU : 160  $\mu$ s US : 190  $\mu$ s
- ☐ Pre - post equalising pulse time EU : 2.2  $\mu$ s US : 2  $\mu$ s
- ☐ Fast genlock on
  - Synchro / Black burst
  - Video camera
  - any VTR/VCRaccept jitter with 15625 Hz (or 15750)  $\pm$  150 Hz
- ☐ Horiz. phase adjust  $\pm$  1  $\mu$ s

## POWER

- ☐ INPUT RATING : 220 V  $\pm$  20% (EU) 110 V  $\pm$  20% (US)
- ☐ FREQUENCY : 50 Hz (EU) 60 Hz (US)
- ☐ POWER : 80 VA (EU) 80 VA (US)
- ☐ FUSE : 2 x 5 A delayed (EU) 2 x 5 A delayed (US)

## ENVIRONMENT

- ☐ OPERATING TEMPERATURE : 0°C to 40°C (32°F to 104°F)
- ☐ STORAGE TEMPERATURE : -20°C to 60°C (-4°F to 140°F)
- ☐ RELATIVE HUMIDITY : 10% to 90% (non-condensing)

## PHYSICAL CHARACTERISTICS

- ☐ DIMENSIONS : 570 x 110 x 465 mm (L x W x H)
- ☐ WEIGHT : 19 Kg (42 lbs)

## ACCESSORIES INCLUDED

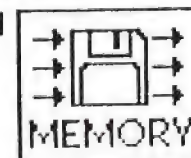
- ☐ Instruction manual
- ☐ Power cable
- ☐ Monitor cable
- ☐ Sound cable
- ☐ Keyboard
- ☐ Tablet and pen
- ☐ SYSTEM software
- ☐ GRAF 65000 software } Cartridge software



# MEMORY

EXTENSION 1  
and DISK

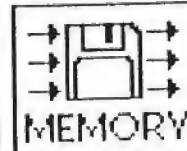
User manual



Congratulations on your decision to purchase this product.  
The SILVER videographic workstation has been developed as the result of five years of research into the needs of professionals in the field of videographic creation and image treatment. The SILVER philosophy combines the latest technology, a flexible approach and the highest standards of construction to offer you a power and flexibility unrivalled at any price.

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## MEMORY 1 (DG-ME1)

MEMORY is supplied with the MEMORY 1/EXTENSION/DISK (DG-150) and offers functions for disk storage and memory plane management.

Many of MEMORY 1's functions will appear in the menus of other applications... the MEMORY and DISK functions of GRAF 65000 for example only appear if the MEMORY EXTENSION 1/DISK (or MEMORY EXTENSION 2 for the MEMORY functions) is connected and the MEMORY 1 cartridge is installed in one of the application slots... GRAF 1's MEMORY PLANE CUT & PASTE function relies on the presence of the MEMORY 1 cartridge... and the UNDO function appears in the menus of all SILVER applications.



### Disk functions



Save image



Load image



Delete file



Disk catalog



Rename file



Prepare disk



### Memory functions



Save image to memory



Load image from memory



Load image from memory



Load image from memory



Swap images



Mix images



Load disk image to memory



Delete memory plane



## Contents

### Chapter 1 introduction

Basic connection plan .....	page 1
Connecting the EXTENSION to the SILVER .....	2
Using disks .....	2
The MEMORY application cartridge .....	3

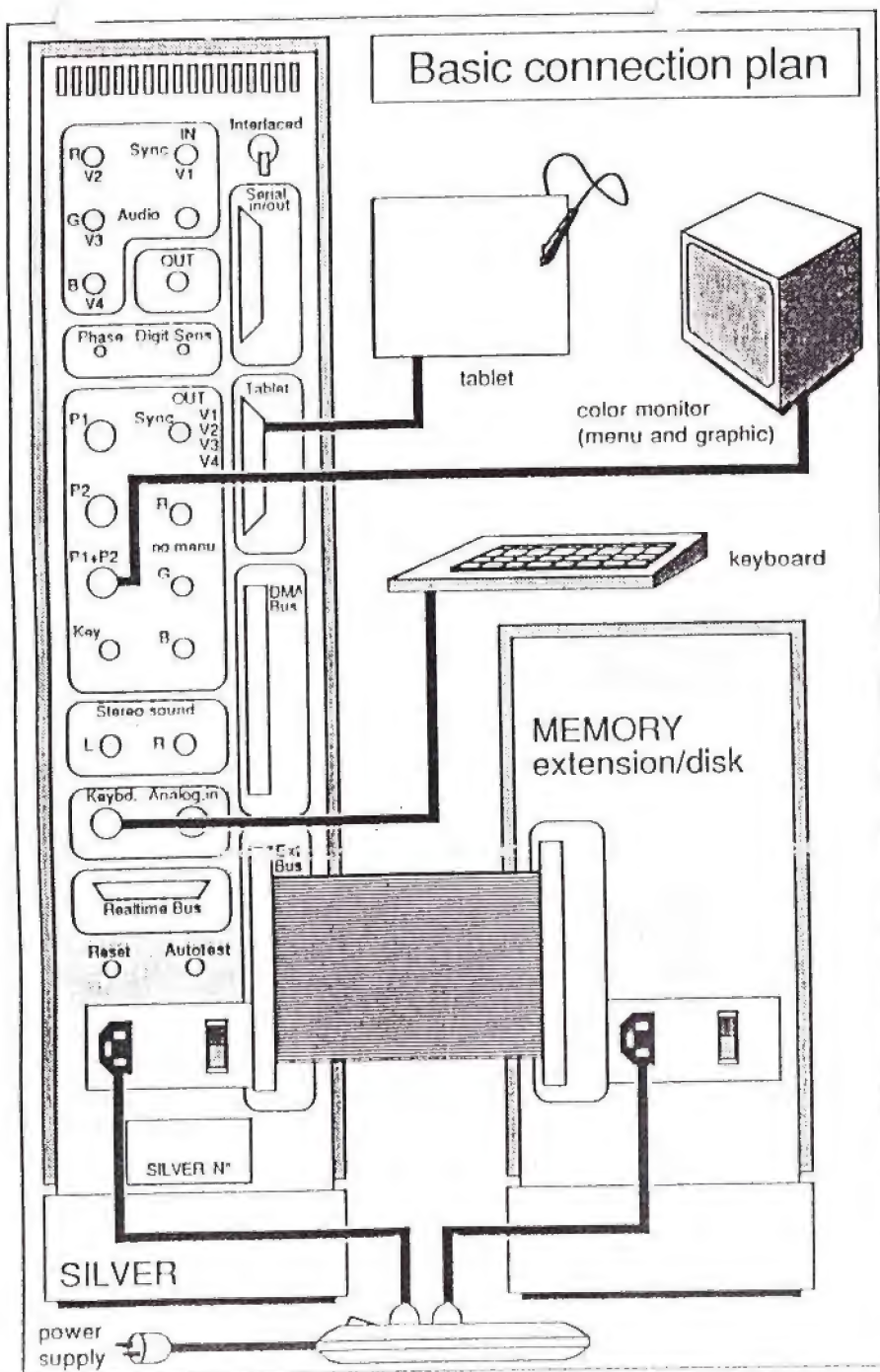
### Chapter 2 disk functions

Calling the MEMORY application .....	page 1
Preparing a disk .....	1
Obtaining a disk catalog .....	2
Renaming a disk file .....	2
Deleting a disk file .....	3

### Chapter 3 technical section

Technical specifications .....	page 1
--------------------------------	--------

## Chapter 1 - introduction



## Connecting the EXTENSION to the SILVER

Carefully remove the MEMORY EXTENSION/DISK unit from its packaging and place on a stable surface beside the SILVER (to the left of the SILVER).

Ensure that the SILVER and the EXTENSION are both switched OFF.

Carefully connect the SILVER to the EXTENSION using the RED CABLE supplied.

Connect the EXTENSION's mains power cable to the socket (to which the SILVER was supplied with the SILVER).

Remove the disk drive transit protection card from the DRIVE slot on the front panel.

Providing the SILVER is correctly connected (to monitor, power, tablet and keyboard), the system is now ready for operation.

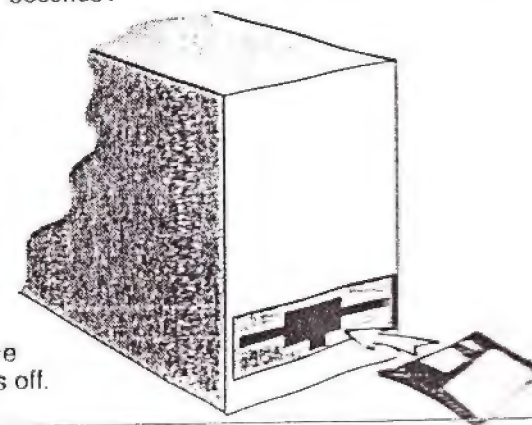
**The extension must ALWAYS be switched on BEFORE the SILVER.**

## Using DISKS

The MEMORY EXTENSION/DISK unit uses standard three and a half inch micro floppy disks. It is strongly recommended that you use a reputable brand of disks... avoid using unbranded disks as they may be of inferior quality or 'seconds'.

Disks are inserted into the drive as shown... the label should be on the top face of the disk and the circular hub underneath. The sliding protection cover should be inserted carefully into the drive slot.

Never leave a disk in the drive when the power is off.

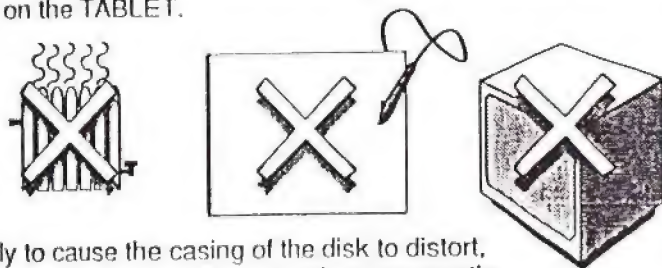


It is possible to protect the contents of a disk from being erased or overwritten. To 'write protect' a disk, slide the small tab on the underside towards the edge of the disk.



#### Warning :

You must NEVER put disks near HEATING appliances, on the TV or MONITOR, or on the TABLET.



Heating is likely to cause the casing of the disk to distort, and the monitor and tablet both have an electromagnetic field which could cause information stored on disk to be corrupted.

## Chapter 2 - disk functions

### The MEMORY application cartridge

The MEMORY EXTENSION/DISK adds another 4 picture planes to the SILVER system. Using these planes it is possible to store images, swap and mix images, cut and paste between images etc., as well as the important UNDO function, which permits the restoration of a screen image after an erroneous manipulation.

The EXTENSION also provides an additional 8 application cartridge slots. Installed in one of these slots, is the MEMORY cartridge. This application handles the management of disk filing functions as well as functions concerning the use of the extension's 4 picture planes.

All of these functions are accessible from within GRAF 65000, apart from DISK PREPARATION, and are described in the GRAF 65000 manual. Only the disk management functions (accessible by clicking the MEMORY icon in the SILVER's menu) will be described in this manual.



## Disk management functions

### Prepare disk

Before saving/loading etc. images, palettes etc. to a floppy disk in the MEMORY EXTENSION/DISK for the FIRST TIME, the disk must be 'prepared'. Preparation will destroy ALL files previously stored on the disk.



### Catalog files (on disk)

The CATALOG function will list any image files present on floppy disk in the MEMORY EXTENSION/DISK unit.



### Rename file (on disk)

By using the RENAME function you can give a new file name to any image file stored on floppy disk in the MEMORY EXTENSION/DISK unit.



### Delete file (from disk)

The DELETE function will delete an image file from floppy disk in the MEMORY EXTENSION/DISK unit.



### Calling the MEMORY application

Position the cursor on the MEMORY icon at the top of the menu... and click the tip of the pen on the tablet. The DISK MANAGEMENT functions appear on the screen.

### Preparing a disk

Click the PREPARE icon... a message appears...

**Warning ! Data on disk will be destroyed. Confirmation ?**

To prepare the disk for use, click YES (any information already stored on the disk will be destroyed once the preparation process has begun).

Preparation in course

When the preparation is finished you are asked to...

Give preparation date in the form : DD/MM/YY



Type in the date (respecting the syntax indicated - date / month / year, using two digits for each element).

Press the RETURN key.

and the disk name :

Type a name for the disk (12 characters maximum).

Press the RETURN key.

Preparation correct

The disk can now be used for saving and loading images, character fonts, palettes, sequences etc.

### To obtain a catalog of disk files

Click the CATALOG icon... the disk preparation date, disk name and a list of all files stored on disk appear.

Click to return to the menu.

### Renaming a file on disk

Click the RENAME icon... a list of all the files contained on the disk is displayed.

Which name ?

Click the file name that you want to change.

Rename :  
(file name)  
as :

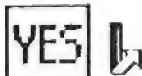




Type the new name for the file...

... and press RETURN.

(file name)  
will be renamed as :  
(new file name)



Click YES... the file name is changed...

(file name)  
has been renamed  
(new file name)



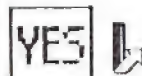
#### Deleting a file from disk

Click the DELETE icon... a list of all files contained on the disk is displayed.

Which name ?

Click the file name that you want to delete.

(file name)  
will be erased.  
Confirmation ?



Click YES... the file is deleted from the disk and the list of remaining files appears. You can select another file for deletion...



...or click at the base of the tablet to call the menu.

## Chapter 3 - technical section

## CONNECTION (to SILVER)



SIGNAL LEVEL : TTL  
CONNECTOR : HE10 60 pins

## MEMORY

☐ 1 megabyte

for images, character fonts,  
sequences, UNDO etc...

TYPE : 4 x 256 K bytes RAM  
SPEED : 150 ns  
CONTROL : access by X,Y registers  
TRANSFER TIME : 0.7 sec per image min.  
(256 Kbytes per second)

## DISK DRIVE

CAPACITY : 1000 K bytes unformatted (500 K bytes per side)  
TRANSFER RATE : 250 K bits per second  
ACCESS TIME : track to track ... 3 ms maximum (unsettled)  
RECORDING DENSITY : 8717 bits per inch maximum  
ENCODING METHOD : MFM  
NUMBER OF TRACKS : 160  
TRACK DENSITY : 135 TPI (tracks per inch)

## CARTRIDGE SLOTS

NUMBER : 8  
CAPACITY PER CARTRIDGE : 64 K bytes ROM 8 K bytes RAM

## POWER

☐ INPUT RATING : 220 V  $\pm$  20% (EU) 110 V  $\pm$  20% (US)  
☐ FREQUENCY : 50 Hz (EU) 60 Hz (US)  
☐ POWER : 80 VA (EU) 80 VA (US)  
☐ FUSE : 2 x 5 A delayed (EU) 2 x 5 A delayed (US)

## ENVIRONMENT (limited by disk unit)

☐ OPERATING TEMPERATURE : 5°C to 40°C (41°F to 104°F)  
☐ STORAGE TEMPERATURE : -20°C to 50°C (-4°F to 122°F)  
☐ RELATIVE HUMIDITY : 20% to 80% (non-condensing)

## PHYSICAL CHARACTERISTICS

☐ DIMENSIONS : 570 x 110 x 263 mm (L x W x H)  
☐ WEIGHT : 7 Kg (15 lbs)

## ACCESSORIES INCLUDED

☐ Instruction manual  
☐ Power cable  
☐ Extension - CPU connection cable  
☐ Disk  
☐ MEMORY 1 software cartridge

# MEMORY

## EXTENSION 2

User manual



MEMORY EXTENSION 2 DG-155  
MEMORY 1 application DG-ME1

Congratulations on your decision to purchase this product.  
The SILVER videographic workstation has been developed as the result of five years of research into the needs of professionals in the field of videographic creation and image treatment. The SILVER philosophy combines the latest technology, a flexible approach and the highest standards of construction to offer you a power and flexibility unrivalled at any price.

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## Contents

Chapter 1 introduction

Chapter 2 connection

The ribbon cable ..... page 1  
Linking EXTENSION 2's / SOFTBOXES ..... 2  
Setting the position selectors ..... 3

Chapter 3 technical section

Chapter 1 - introduction

## Introduction to MEMORY EXTENSION 2

### An additional 2 megabytes of user memory

The MEMORY EXTENSION 2 adds another 2 megabytes of user memory to the SILVER system (for storing character fonts, sequences, etc. and up to 9 image planes).

The enormous advantages offered by the MEMORY EXTENSION 2 will become clear as you start to use applications previously limited by the number of images, sequences, character fonts etc. that could be held in memory at any one time.

### SOFTBOX capacity

An additional 16 software application cartridge slots are provided with the MEMORY EXTENSION 2 (equivalent to a SOFTBOX).

### Expanding the system

A maximum of 7 EXTENSION 2's can be connected in chain... this means that a system incorporating a MEMORY EXTENSION 1/DISK and 7 EXTENSION 2's offers a capacity of 15 megabytes RAM (equivalent to 67 image planes) with 128 software application slots.

### Setting up the new system

In order to set up your system correctly it is essential that you read the CONNECTION chapter of this manual carefully. Pay great attention to the order in which units are connected in chain, as well as the setting of the position selector switch for each unit.

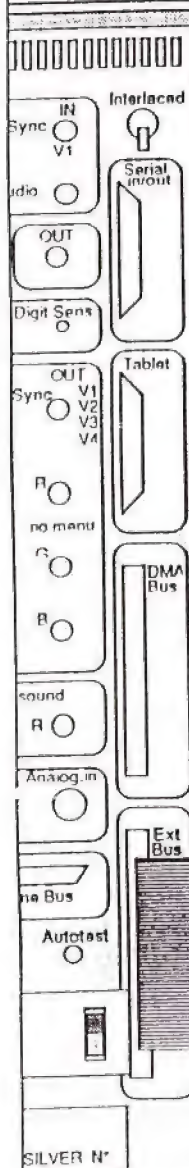
### The MEMORY 1 application cartridge (DG-ME1)

The presence of the MEMORY EXTENSION 1/DISK is not prerequisite. For this reason the application cartridge MEMORY 1 (which manages the image plane functions) is also included (already installed) in the EXTENSION 2. If you already own the MEMORY EXTENSION 1/DISK you can (if you wish) remove the old MEMORY 1 cartridge which is installed in one of its application slots (this however is optional as only one MEMORY 1 cartridge will be acknowledged by the system).

## Chapter 2 - connection



## The ribbon cable



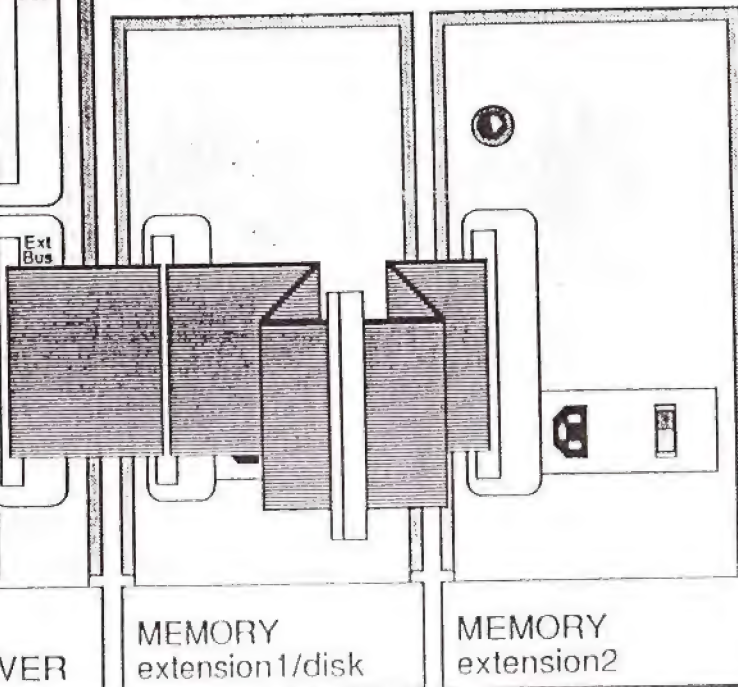
A ribbon cable is supplied with the MEMORY EXTENSION 2. This cable has two female and one male connector.

Assuming you already have the SILVER connected to a MEMORY EXTENSION 1/DISK... you must first disconnect the existing ribbon cable (with two female connectors) which connects these two units.

Plug the new cable's two female connectors into the SILVER and the EXTENSION 1/DISK (which will leave a length of cable with the male connector free).

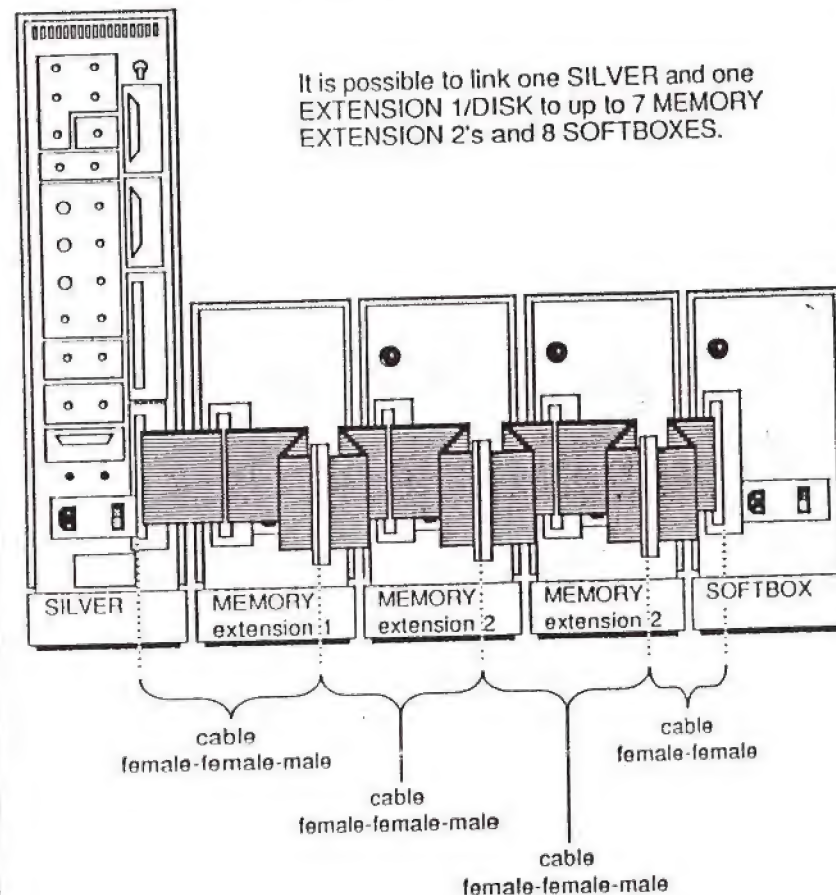
Connect one end of the OLD cable to the new male connector... and the other end of the OLD cable into the MEMORY EXTENSION 2 socket.

Note that if you already have one EXTENSION 2 and are adding a second, the same principle is used (see examples further on).



## Linking multiple extension 2's / softboxes

It is possible to link one SILVER and one EXTENSION 1/DISK to up to 7 MEMORY EXTENSION 2's and 8 SOFTBOXES.

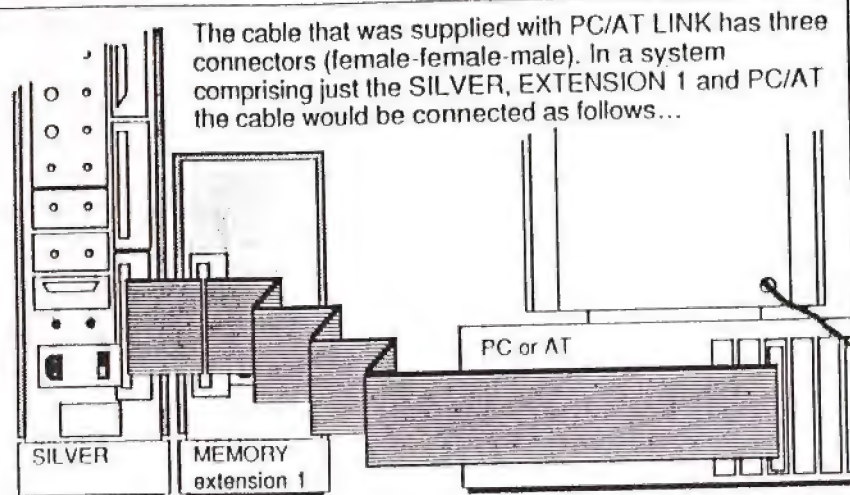


When setting up a multiple system the following order must be respected... SILVER > MEMORY EXTENSION 1/DISK > MEMORY EXTENSION 2 (up to 7 units) > SOFTBOXES (up to 8 units).

If (as in the example shown above) you already have 2 EXTENSION 2's and one SOFTBOX, and you wish to add one more SOFTBOX and one more EXTENSION 2... you must add the new SOFTBOX at the END of the chain (far right in the diagram), and the new MEMORY 2 between the last existing MEMORY 2 and the first existing SOFTBOX.



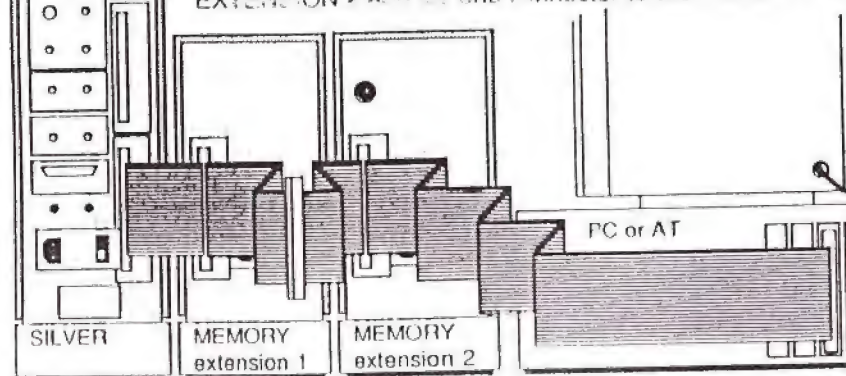
## For users with the PC/AT LINK



### Installing the MEMORY EXTENSION 2

Disconnect the old PC/AT cable. Position the EXTENSION 2 beside the EXTENSION 1. Connect the new cable (supplied with the EXTENSION 2/SOFTBOX) to the SILVER and EXTENSION 1 in place of the old cable (the male connector is free on the trailing end of the cable).

Connect one end of the old cable (the end that WAS connected to the SILVER) to the new cable's male connector... connect the middle connector to the EXTENSION 2 and for end connector to the PC or AT.

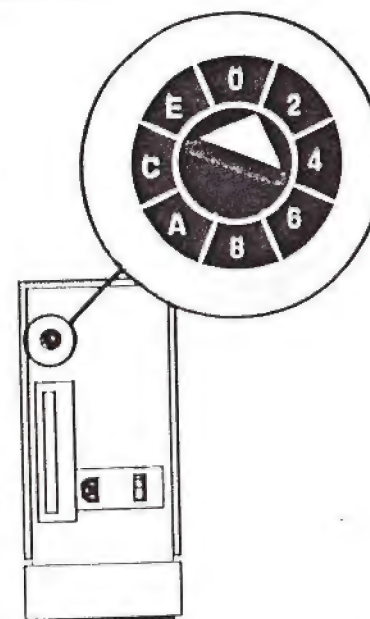


The ribbon cable must NOT be twisted (whether the PC/AT is positioned to the left or right of the system) and the order of connection is always... SILVER > EXTENSION 1 > EXTENSION 2s > SOFTBOXES > PC or AT.

## Setting the position selectors

The relative positions of each MEMORY EXTENSION or SOFTBOX unit in the chain are of extreme importance. Each unit has a selector switch which must be set to correspond to its relative position in the chain.

Before setting the selectors, switch OFF the SILVER and all connected EXTENSIONS.



The selector switch is located on the units back panel (above the connector socket). There are 16 positions for the selector (0 to 9 and A to F... the odd numbers / letters are indicated by the lines between the characters). The switch position can be changed using a small flat-bladed screwdriver.

MEMORY EXTENSION 2's can occupy positions 1 to 7 (the maximum number of units that can be connected) and SOFTBOXES can occupy positions 1 to F.

Note that the factory setting for the selector switch is position 1

In the example shown previously the EXTENSION 2 nearest to the SILVER must be set to 1... the next EXTENSION 2 must be set to 2 and the SOFTBOX to 3.

If a third EXTENSION 2 and a second SOFTBOX is added to the chain, the selector switch settings must be adjusted accordingly... the new EXTENSION 2 must be set to 3, the existing SOFTBOX must be set to 4 and the new SOFTBOX must be set to 5.



Position 0 (the position reserved for use by the EXTENSION 1/DISK) is NEVER used and the unit will not function if this is set.



## Chapter 3 - technical section

## CONNECTION (SILVER, EXTENSIONS, SOFTBOX)



SIGNAL LEVEL : TTL  
CONNECTOR : HE 10 60 pins

## MEMORY

- ☐ 2 megabytes RAM for images, character fonts, sequences, UNDO etc...  
(9 image planes)

TYPE : 8 x 256 K bytes RAM  
SPEED : 150 ns  
CONTROL : access by X,Y registers  
TRANSFER TIME : 0.7 sec per image min.  
(256 Kbytes per second)

## CARTRIDGE SLOTS

NUMBER : 16  
CAPACITY PER CARTRIDGE : 64 K bytes ROM 8 K bytes RAM

## POWER

☐ INPUT RATING : 220 V  $\pm$  20% (EU) 110 V  $\pm$  20% (US)  
☐ FREQUENCY : 50 Hz (EU) 60 Hz (US)  
☐ POWER : 80 VA (EU) 80 VA (US)  
☐ FUSE : 2 x 5 A delayed (EU) 2 x 5 A delayed (US)

## ENVIRONMENT

- ☐ OPERATING TEMPERATURE : 0°C to 40°C (32°F to 104°F)  
☐ STORAGE TEMPERATURE : -20°C to 50°C (-4°F to 122°F)  
☐ RELATIVE HUMIDITY : 10% to 90% (non-condensing)

## PHYSICAL CHARACTERISTICS

- ☐ DIMENSIONS : 570 x 110 x 263 mm (L x W x H)  
☐ WEIGHT : 7 Kg (15 lbs)

## ACCESSORIES INCLUDED

- ☐ Instruction manual  
☐ Power cable  
☐ Extension - CPU connection cable  
☐ MEMORY 1 software cartridge

# FADEC

Multistandard  
decoder / variable  
transparence mixer

User manual





Congratulations on your decision to purchase this product.  
The SILVER videographic workstation has been developed as the result of five years of research into the needs of professionals in the field of videographic creation and image treatment. The SILVER philosophy combines the latest technology, a flexible approach and the highest standards of construction to offer you a power and flexibility unrivalled at any price.

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### Chapter 1 - introduction

## Multistandard decoder functions

### Automatic mode

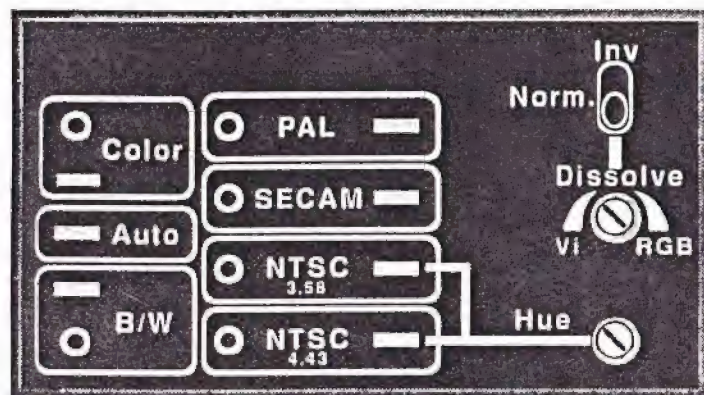
The FADEC automatically recognizes the standard of a signal presented to it (PAL, SECAM, NTSC 3.58 or NTSC 4.43), and indicates that standard on the front panel. Automatic mode is enabled by pressing the **AUTO** button on the front panel (set by default after power-up).

### The search phase

In **AUTO** mode, when a signal is presented to the FADEC the **COLOR** and **AUTO** L.E.D.s light up... then the PAL, SECAM, NTSC 3.58 and NTSC 4.43 L.E.D.s light one after the other in sequence. When the signal standard has been identified the relevant L.E.D. remains lit. If the FADEC encounters a serious deterioration in the signal it may set itself into **SEARCH** mode.

### Manual mode

It is possible at any time to manually lock onto a particular standard (this avoids the need for the unit to place itself in search mode in the possible event of a recording defect). You can manually set the FADEC by pressing one of the buttons (PAL, SECAM, NTSC 3.58 or NTSC 4.43) on the front panel.



the FADEC's front panel

### Black and white mode

Pressing the **B/W** (black & white) button will eliminate the color element and output the **Y** signal without filtering to the **R**, **G** and **B OUT** sockets. It is capable of eliminating the color subcarrier while enabling the filters relative to the standards **PAL**, **SECAM** or **NTSC 3.58**.

If the input signal is of very low quality (eg : a recording with a high level of chroma noise) it may be desirable to use **BLACK & WHITE** mode. This procedure disables the chroma processing but not the high frequency component... you can eliminate that by pressing one of the standard buttons... **PAL**, **SECAM**, **NTSC 3.38** or **NTSC 4.43** (the **NTSC 4.43** filter is the same as the **PAL** filter).

### Color mode

Pressing the **COLOR** button will also re-enable automatic mode.

### Non filtered black & white mode

You can set a non filtered black and white mode by pressing the **COLOR** and **B&W** buttons together (both L.E.D.s are lit). This function is justified while using recordings made in black and white. These do not comprise a subcarrier... don't be afraid to use the filters to limit the passing tape signal (and thereby the sharpness of the image).

### Adjusting the hue

In **NTSC** mode (3.58 or 4.43 ) the **HUE** control allows adjustment of the subcarrier phase (to obtain a good color balance). This is an adjustment that is found on all american and japanese televisions (sold for use in the **USA** or **Japan**).



## Variable transparency functions

### Dissolve

The Vi...RGB control is enabled by setting the switch in dissolve position. When the potentiometer is turned fully anti-clockwise (Vi), the signal input at VIDEO IN is sent in its entirety to the final output of the FADEC (and to the monitor output socket). When turned fully clockwise (RGB), it is the signal input at the R, G and B IN sockets which is sent to the final output (and to the monitor). By turning the potentiometer one can move progressively between the input encoded video image to the input RGB image... thus producing a dissolve between two images.

### Key mode

This mode is selected by setting the INV/NORM/DISSOLVE switch in either NORMAL or INVERSE position, and requires the injection of a key signal (at the KEY input on the back panel)... this signal is identical to a video signal which only provides blacks and whites. The transitions then determine the outlines of a window which allows the coded video image to be viewed within the RGB image (or the contrary when in INVERSE mode).

### "Blurred" wipe mode

This function is in fact an extension of the KEY mode whereby the FADEC responds to the KEY signal in an analog manner. It is possible to command all types of wipes and dissolves by direct action of this signal (the signal must be elaborated using another unit).

### Digitally commanded variable transparency

This function is piloted by a digital signal injected via the MIX CONTROL socket on the back panel of the FADEC. In addition to the control signals and the clock signal, an 8 bit bus is decoded by a D/A convertor working to pixel accuracy and allowing the selection of 256 transparency levels. It is also possible to work only in 4 bits (which defines 16 transparency levels). The NORMAL/INVERSE switch is active during this function.

## Chapter 2 - technical section



The diagram illustrates the control panel of the Silver N\* system, divided into two main sections. The left section contains various input and output controls, while the right section features a FADEC (Fuel/Air/Fuel/Exhaust/Control) unit. A thick black line traces the signal path from the video source to the FADEC unit.

**Left Panel Controls:**

- Top Section:** Includes a row of 16 indicator lights. Below them are buttons for R (V2), G (V3), and B (V4). A "Sync" button is also present. A "Serial in/out" port is located in the center.
- Middle Section:** Features a "Phase" button, "Digit S" (likely Digit Select), and "ns." (likely Nanoseconds).
- Bottom Section:** Includes a "Tablet" display, "DMA Bus" indicator, "Ext Bus" indicator, and a "SILVER N\*" label at the bottom.

**Right Panel Controls (FADEC):**

- Top Section:** Includes a row of 16 indicator lights. Below them are buttons for R, G, and B. A "Sync" button is also present. A "Key" button is located in the center.
- Middle Section:** Features a "Decoder" button, "OUT Video IN" buttons, and a "Monitor" button.
- Bottom Section:** Includes a "Mix control" button, a "FADEC" label, and a "from video source (video OUT, of camera/VCR etc.)" label.

**Connections:**

- A thick black line connects the "Sync" button on the left panel to the "Sync" button on the right panel.
- A thick black line connects the "Key" button on the left panel to the "Key" button on the right panel.
- A thick black line connects the "Serial in/out" port on the left panel to the "Serial in/out" port on the right panel.
- A thick black line connects the "Phase" button on the left panel to the "Phase" button on the right panel.
- A thick black line connects the "DMA Bus" indicator on the left panel to the "DMA Bus" indicator on the right panel.
- A thick black line connects the "Ext Bus" indicator on the left panel to the "Ext Bus" indicator on the right panel.
- A thick black line connects the "SILVER N\*" label on the left panel to the "SILVER N\*" label on the right panel.

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The diagram illustrates the FADEC (Front Accessory Device Expansion Card) and its connections. The FADEC card is shown with various ports and components:

- Interlaced**: A port for interlaced video input.
- Serial in/out**: A port for serial communication.
- Audio**: A port for audio input.
- Video**: A port for video input.
- Key**: A port for a key input.
- RGB**: A port for RGB video input.
- Mixer**: A port for a mixer input.
- Monitor**: A port for a monitor input.
- control monitor**: A port for a control monitor input.
- FADEC**: The main expansion card.
- Buttons and Indicators**: P1, P2, P1+P2, Key, Stereo sound (L, R), Keybd. Analog.in, Realtime Bus, Reset, Autotest, and SILVER N°.

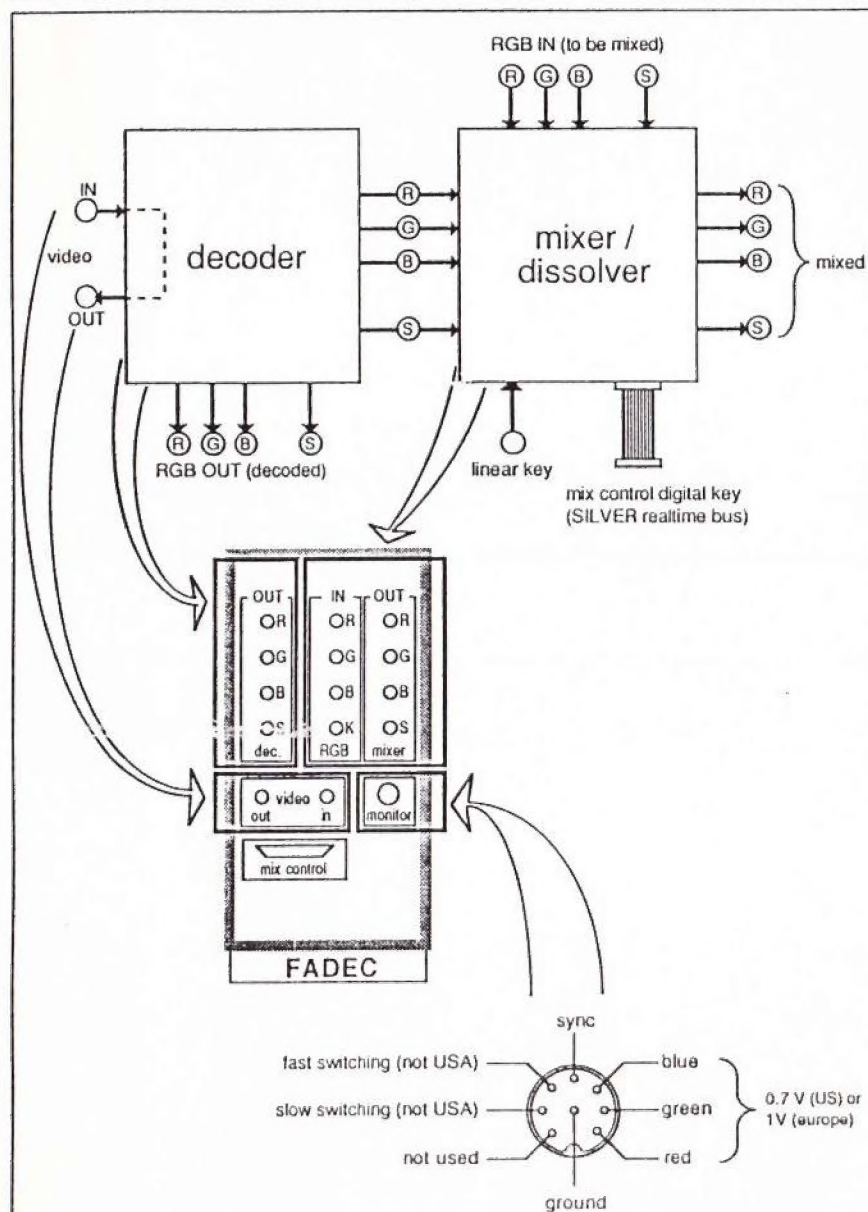
The connections are as follows:

- Interlaced** and **Serial in/out** are connected to the **Interlaced** and **Serial in/out** ports of the FADEC card.
- Audio** is connected to the **Audio** port of the FADEC card.
- Video** is connected to the **Video** port of the FADEC card.
- Key** is connected to the **Key** port of the FADEC card.
- RGB** is connected to the **RGB** port of the FADEC card.
- Mixer** is connected to the **Mixer** port of the FADEC card.
- Monitor** is connected to the **Monitor** port of the FADEC card.
- control monitor** is connected to the **control monitor** port of the FADEC card.
- FADEC** is connected to the **FADEC** port of the FADEC card.
- Buttons and Indicators** are connected to the corresponding ports and components of the FADEC card.

Technical section page 2



## FADEC synoptic



FADEC monitor output socket (female) - viewed from exterior  
(same pin connections as for the SILVER and the ENCODER)

## VIDEO INPUT SIGNALS

Comp	TYPE	: Composite video PAL, SECAM, NTSC 3.58, NTSC 4.43, B & W
	NOMINAL LEVEL	: Bright 0.7 V Sync 0.3 V
	POLARITY	: Positive bright, negative sync
	IMPEDANCE	: 75 $\Omega$
	CONNECTOR	: BNC connector
R	TYPE	: RGB analog
G	NOMINAL LEVEL	: 0.7 Vpp (non composite)
B	POLARITY	: Positive bright
	IMPEDANCE	: 75 $\Omega$
	CONNECTOR	: 3 BNC connectors
Key	TYPE	: Composite B & W
	NOMINAL LEVEL	: 0.7 V
	POLARITY	: Bright (Key) 0.7 V Sync 0.3 V
	IMPEDANCE	: 75 $\Omega$
	CONNECTOR	: BNC connector

## VIDEO OUTPUT SIGNALS

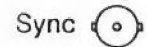
Video	TYPE	: Composite video
	NOMINAL LEVEL	: Bright 0.7 V Sync 0.3 V
	POLARITY	: Positive bright, negative sync
	IMPEDANCE	: 75 $\Omega$
	CONNECTOR	: BNC connector
R	TYPE	: RGB analog
G	NOMINAL LEVEL	: 0.7 Vpp (non composite)
B	POLARITY	: Positive bright
	IMPEDANCE	: 75 $\Omega$
	CONNECTOR	: 3 BNC connectors



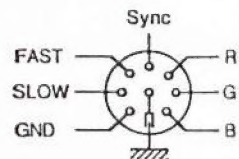
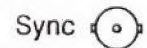
### Mixer



TYPE : RGB analog  
 NOMINAL LEVEL : 0.7 Vpp (non composite)  
 POLARITY : Positive bright  
 IMPEDANCE : 75  $\Omega$   
 CONNECTOR : 3 BNC connectors

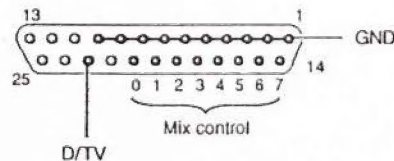


TYPE : Composite Sync  
 NOMINAL LEVEL : 0.8 V to 1.5 Vpp  
 POLARITY : Negative  
 IMPEDANCE : 75  $\Omega$   
 CONNECTOR : 2 BNC connectors



TYPE : Monitor  
 RGB LEVELS : 1 Vpp (0.7 Vpp USA) 75  $\Omega$ , non composite  
 SYNC LEVEL : 0.8 V to 1.5 Vpp, negative  
 SLOW switching : 10 to 15 V positive, 10 K  $\Omega$   
 FAST switching : 1 V positive, 75  $\Omega$   
 CONNECTOR : 8 pin DIN connector

### DIGITAL INPUT SIGNALS



TYPE : Mix control  
 NOMINAL LEVELS : TTL, HCT  
 8 BYTES : 0  $\rightarrow$  LSB, 7  $\rightarrow$  MSB  
 D/TV : 0 Logic (L)  $\rightarrow$  Analog Key  
 1 Logic (H)  $\rightarrow$  Digital control Key  
 CONNECTOR : SUB.D 25 pins

### KEY SPECIFICATIONS

